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10/825,689	04/16/2004	Suning Wang	2003-009-03US	8857

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CANADA

EXAMINER
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YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/825,689

Applicant(s)

WANG ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 11,14,15,22,23 and 32-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10,12,13,16-21 and 24-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>rec'd 25 Oct 2004</u> . | 6) <input type="checkbox"/> Other: _____  |

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1. Applicant's election with traverse in the reply filed on May 26, 2006 is acknowledged.

In response to the restriction requirement, applicant elected Group I (claims 1-10, 12, 13 and 16).

In response to the election of species requirement, applicant selected compound (4) as the ultimate species, which is a compound within the scope of general formulae (1A), (1B) and (1C) as defined in claims 1-3. Claims 1-10, 12, 13 and 16 read on the elected species for Group I.

Applicant traversed the restriction requirement with respect to the restriction between Groups I, II, III and VII. Applicant did not traverse the restriction requirement with respect to the other Groups set forth in the requirement. Applicant also did not traverse the election of species requirement with respect to Group I.

With respect to the traversal for Group II, applicant's arguments are not found persuasive because Group I covers numerous compounds. While the method claims of Group II depend from the broadest Group I claims, the method steps recited in the Group II claims directly synthesize only a few of the compounds within the scope of Group I, and it is not clear if these few compounds can be further treated per the claimed method of synthesizing in order to provide the full scope of Group I compounds. It is also not necessary to determine the patentability of the Group II method in order to determine the patentability of the Group I compounds, and vice versa. The requirement with respect to Group II (and Groups for which no traversal is stated) is still deemed proper and is therefore made FINAL. The examiner notes that withdrawn process claims will be considered for rejoinder upon allowance of a product claim. See MPEP 821.04(b).

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With respect to the traversal for Group III, the examiner withdraws the restriction requirement in consideration of art found in the prior art search for Group I. The claims of Group III are examined subject to the election of species with respect to Group I.

With respect to the traversal for Group VII, during a telephone conversation with Carol Miernicki Steeg on July 19, 2006, the examiner agreed to consider the Group VII claims, subject to election of a specific device selected from those recited in the claims. As noted in the requirement mailed April 26, 2006, Group VII provides for several patentably distinct species of devices. During the telephone conversation, an electroluminescent device was elected as the species for the Group VII device. Claims 20, 21 and 24-31 read on the elected species of device. Affirmation of this election must be made by applicant in replying to this Office action. During the telephone conversation, the examiner did not confirm whether this election was without traverse. Any traversal of the election of species requirement with respect to Group VII must be set forth in response to this Office action. The claims of Group VII are also examined subject to the election of species with respect to Group I.

2. Claims 11, 14 and 15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction requirement with respect to these claims in the reply filed on May 26, 2006.

Claims 23 and 32-44 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking

claim. Election was made **without** traverse with respect to these claims in the reply filed on May 26, 2006.

Claims 22 and 45-51 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. As previously noted, any traversal with respect to the election of species requirement for Group VII device must be set forth in response to this action.

3. Regarding the election of species with respect to the Group I compound, the ultimate species selected by applicant (compound (4)) was used as the starting point for search and examination purposes of Groups I, III and VII.

While some prior art is applied against non-elected species in this action, this action does not represent an examination on the merits of all species within the scope of the examined claims.

4. The drawings are objected to because some of the numbers along the x-axis and y-axis in figures 15A, 15B and 21 are not clearly readable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and

where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. Claims 26-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of claims 26-31 requires a layer "which is" a compound as claimed in an earlier compound claim. It is not clear if the layer must consist of the compound, or if it is sufficient for the layer to comprise the compound.

6. Regarding claims 4-6, absent objective evidence to the contrary, all compounds within the scope of present formulae (1A), (1B) and (1C) as defined in claims 1-3 are considered to be capable of exhibiting photoluminescence and/or electroluminescence.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-10, 12, 13, 17-21, 27 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 05-320634.

A machine-assisted translation of JP '634 is provided with this Office action.

The prior art discloses dipyriddyamines within the scope of present claims 1-10, 12 and 13. For example, see prior art claim 1 and paragraphs [0005]-[0009].

JP 05-320634 anticipates compounds of present formula (1A) as defined in present claim 1 wherein each of X<sup>5</sup>, X<sup>6</sup> and X<sup>7</sup> represents nitrogen, and wherein either n is 0 and Z is biphenyl substituted with an amino group or n is 1 and Z is phenyl substituted with an amino group.

JP 05-320634 anticipates compounds of present formula (1B) as defined in present claim 2 wherein each of X<sup>8</sup>, X<sup>9</sup> and X<sup>10</sup> represents unsubstituted nitrogen, wherein either m is 0 and Z is biphenyl substituted with an amino group or m is 1, r is 0 and Z is phenyl substituted with an amino group, and wherein each of p and q is 0-4 and each of S and T is an aryl group, an alkoxy group or an aliphatic group.

JP 05-320634 anticipates compounds of present formula (1C) as defined in present claim 3 wherein each of Z<sup>3</sup> and Z<sup>4</sup> represents a substituted or unsubstituted pyridyl wherein the substituent is an aryl group, an alkoxy group or an aliphatic group, and wherein either m is 0 and

$Z^2$  is biphenyl substituted with an amino group or m is 1, r is 0 and  $Z^2$  is phenyl substituted with an amino group.

The prior art dipyriddyamine compounds are disclosed for use as hole transport materials in organic electroluminescent (EL) elements (devices). A dipyriddyamine compound may be used in a hole transport layer that is separate from the luminescent layer of the device, or may be used in the luminescent layer of the device in combination with a luminescent material. The device may also comprise an electron transport layer. For example, see prior art claim 1 and paragraphs [0015]-[0024]. The device structures disclosed by the prior art anticipate a device as claimed in present claims 29 and 30. Claims 27 and 31 are included in this rejection subject to clarification as to whether the layer “which is” a compound as claimed in claims 4, 5 or 6 (in the case of claim 27) or claims 1, 2 or 3 (in the case of claim 31) must consist of the compound. If it is sufficient for the emitting/electron-transporting/hole-transporting layer of claim 27 and the emitting/hole-transporting layer of claim 31 to comprise the compound, then the prior art also anticipates a device as claimed in claims 27 and 31. The prior art EL devices also meet the limitations of a product as claimed in claims 20 and 21. With respect to the product of claims 20 and 21, also see paragraph [0027].

The prior art dipyriddyamine compound may be mixed with a polymer and a layer may be formed by a solution coating method (which implies a solvent), thus anticipating a composition as claimed in present claims 17-19. For example, see paragraphs [0014] and [0018].

9. Claims 1-10, 12, 13, 20, 21, 24, 25 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Pang et al. in *Journal of Materials Chemistry* 2002, Vol. 12, pp. 206-212 (published as an Advance Article on the Web on December 11, 2001).

Pang et al. disclose three compounds within the scope of present general formulae (1A), (1B) and (1C), and teach their use in an organic EL device. See the whole article. In particular see formulae 1, 2 and 4 on page 207, Table 2 on p. 208, Fig. 4 and Fig. 5 on p. 209, the paragraph bridging pp. 209-210, the first two full paragraphs on p. 210, and the last paragraph on p. 211.

Compound 1 of the prior art meets the limitations of a compound as defined in present claim 1 wherein each of  $X^5$ ,  $X^6$  and  $X^7$  represents nitrogen,  $n$  is 0 and  $Z$  is phenyl substituted with amino groups. Compound 1 also meets the limitations of a compound as defined in present claim 2 wherein each of  $X^8$ ,  $X^9$  and  $X^{10}$  represents nitrogen,  $m$  is 0 and  $Z$  is phenyl substituted with amino groups. Compound 1 also meets the limitations of a compound as defined in present claim 3 wherein each of  $Z^3$  and  $Z^4$  represents a pyridyl group,  $m$  is 0 and  $Z^2$  is phenyl substituted with amino groups. Compound 1 further meets the limitations of the compound defined in present claims 4-10 and 12.

Compound 2 of the prior art meets the limitations of a compound as defined in present claim 1 wherein each of  $X^5$ ,  $X^6$  and  $X^7$  represents nitrogen, and wherein either  $n$  is 0 and  $Z$  is biphenyl substituted with aryl groups or  $n$  is 1 and  $Z$  is phenyl substituted with an aryl group. Compound 2 also meets the limitations of a compound as defined in present claim 2 wherein each of  $X^8$ ,  $X^9$  and  $X^{10}$  represents unsubstituted nitrogen, and wherein either  $m$  is 0 and  $Z$  is

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biphenyl substituted with aryl groups or m is 1 and Z is phenyl substituted with an aryl group.

Compound 2 also meets the limitations of a compound as defined in present claim 3 wherein each of  $Z^3$  and  $Z^4$  represents a pyridyl group, and wherein either m is 0 and  $Z^2$  is biphenyl substituted with aryl groups or m is 1 and  $Z^2$  is phenyl substituted with an aryl group.

Compound 2 further meets the limitations of the compound defined in present claims 4-10, 12 and 13.

Compound 4 of the prior art meets the limitations of a compound as defined in present claim 1 wherein each of  $X^5$ ,  $X^6$  and  $X^7$  represents nitrogen, n is 0 and Z is phenyl substituted with an aryl group. Compound 4 also meets the limitations of a compound as defined in present claim 2 wherein each of  $X^8$ ,  $X^9$  and  $X^{10}$  represents nitrogen, m is 0 and Z is phenyl substituted with an aryl group. Compound 4 also meets the limitations of a compound as defined in present claim 3 wherein each of  $Z^3$  and  $Z^4$  represents a pyridyl group, m is 0 and  $Z^2$  is phenyl substituted with an aryl group. Compound 4 further meets the limitations of the compound defined in present claims 4-10 and 12.

10. Claims 1-9, 12, 13, 20, 21 and 24-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al. (US 5,635,308).

Inoue et al. disclose various compounds within the scope of one or more of present general formulae (1A), (1B) and (1C), and teach their use in an organic EL device.

For example, compounds I-7, II-7 and similar compounds are compounds of present formula (1A) wherein  $X^7$  represents nitrogen, each of  $X^5$  and  $X^6$  represents carbon, and wherein

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either n is 0 and Z is phenyl substituted with an aryl group or n is 1 and Z is anthryl substituted with an aryl group. See columns 7-10 for the structure of compounds I-7 and II-7. These compounds further meet the limitations of a compound having general formula (1B) as defined in claim 2, the limitations of a compound having general formula (1C) as defined in claim 3, and the limitations of claims 4-9, 12 and 13.

Inoue et al. teach various layered structures for an EL device, and teach that the compounds may be used in the light emitting layer, hole-injecting/transporting layer or electron-injecting/transporting layer of an EL device. For example, see column 29, line 52-c. 30, l. 49.

11. Claims 2, 3, 5-7, 12, 13, 16-21 and 24-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. (WO 2004/020388 A1).

The 102(e) date for this reference is August 25, 2003. In applying the Saito reference against some of the present claims, the examiner has considered the disclosure of present applicant's priority provisional application, 60/463,336, filed April 17, 2003. The examiner notes that the provisional application discloses present general formula (1A) and compounds (2), (3) and (4). The provisional application does not disclose present general formulae (1B) and (1C), or compounds (5) and (6). While compound (5) is within the scope of general formula (1A), it is the examiner's position that the disclosure of general formula (1A) in the priority application is insufficient to support compound (5).

Claims which depend from claim 1, 2 or 3, or from 4, 5 or 6, or from 1, 2, 3 or 16 are included in this rejection as dependent from 2, 3, 5, 6 or 16, as appropriate.

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Saito's compound 31 is present applicant's compound (5). See formula [1] on page 4 and compound 31 as defined in Table 3 on page 16 of the Saito reference.

Saito et al. also disclose other compounds within the scope of present general formula (1B) and/or (1C) that are not within the scope of present general formula (1A) or are not sufficiently supported by general formula (1A), and thus are not supported by applicant's priority application. For example, see compounds 44-46, 48-66, 69-77, 80 and 81 as defined in Tables 3-6 of the Saito reference.


Saito's compounds are disclosed for use in an organic luminescence (EL) device. Various layered structures are disclosed for the EL device, and the compounds of Saito's formula [1] may be used in a luminescent layer, electron-transporting layer or hole-transporting layer of the device. For example, see page 22, lines 5-13, p. 42, l. 1-p. 45, l. 20, and figures 1-6. The various layered structures of present claims 24-31 are anticipated by the prior art.

With respect to present claims 17-19, see the paragraph bridging pages 51 and 52 for example. Also note that a compound of Saito's formula [1] may be used in combination with polymers other than binder resins, such as polymeric materials as disclosed on pages 50 and 51.

12. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY  
August 04, 2006

  
MARIE YAMNITZKY  
PRIMARY EXAMINER

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